PHYSICS NMDCAT

TOPIC WISE TEST (UNIT–4)

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03418729745(WhatsApp Groups)

TOPIC:

✓ **Waves**

Q.1 The speed of sound waves having a frequency of 256 Hz, compared with the speed of sound waves having a frequency of 512Hz is

A. Half as great   B. Four times as great

C. Twice as great   D. Same

Q.2 Speed of sound in a gas is proportional to

A. Square root of isothermal elasticity   B. Isothermal elasticity

C. Square root of adiabatic elasticity   D. Adiabatic elasticity

Q.3 With the propagation of a longitudinal wave through a material medium, the quantities transferred in the direction of propagation are

A. Energy, momentum and mass   B. Energy and mass

C. Energy and momentum   D. Energy

Q.4 When a wave goes from one medium to another, there is a change in the

A. Velocity   B. Frequency

C. Wavelength   D. Both "A" and "B"

Q.5 How does the speed v of sound in air depend on the atmospheric pressure P?

A. $v \propto P^{-1}$ B. $v \propto P^{1/2}$

C. $v \propto P^{2}$ D. $v \propto P^{0}$

Q.6 At what temperature the speed of sound in air will be 1.5 times its value at 27°C in air?

A. 102°C   B. 204°C

C. 204°C   D. 402°C

Q.7 When sound waves enter from air into water, then

A. λ increases   B. Frequency increases

C. Speed decreases   D. All of them

Q.8 The velocity of sound is v_s in air. If density of air is increased twice then the new velocity of sound will be

A. v_s B. $\sqrt{2}v_s$

C. $\dfrac{v_s}{\sqrt{2}}$ D. $\dfrac{3}{2}v_s$

Q.9 An ultrasonic scanner is used in a hospital to detect tumour in tissue. The working frequency of the scanner is 4.2 mega Hz. The velocity of sound in the tissue is 2.1 kms^{-1}. The wavelength of sound in the tissue is nearest to

A. 4×10^{-3} m   B. 5×10^{-4} m

C. 8×10^{-3} m   D. 8×10^{-4} m

Q.10 The percentage error in Newton's formula for the speed of sound in air is

A. 15%   B. 20%

C. 16%   D. 10%

Q.11 When a source of sound is in motion towards a stationary observer, the effect observed is

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A. Increase in the velocity of sound only
B. Increase in frequency of sound only
C. Decrease in the velocity of sound only
D. Increase in both the velocity and the frequency of sound

Q.12 **The velocity of sound is generally greater is solids than in gases because**
A. The density of solids is high and the elasticity is low
B. The density of solids is low and the elasticity is high
C. Both the density and the elasticity of solids are very low
D. The elasticity of solids is very high

Q.13 **In sound waves during the compressions**
A. density of medium is maximum
B. density of the medium is minimum
C. pressure of medium is maximum
D. both 'A' and 'B'

Q.14 **The isothermal elasticity of a medium is E_i and the adiabatic elasticity is E_a. The velocity of the sound in the medium is proportional to**
A. $\sqrt{E_i}$
B. $\sqrt{E_a \gamma}$
C. E_a
D. E_i

Q.15 **A particular wavelength received from a galaxy is measured on earth and is found to be 5% more then that its' wave length. Hence galaxy is**
A. Moving towards earth
B. stationary with respect to earth
C. Going away from earth
D. none of these

Q.16 **Which of the following has maximum audible frequency range?**
A. Dolphin
B. Cat
C. Bat
D. Dog

Q.17 **Doppler Effect is used to monitor blood flow through major arteries by ultrasound waves of frequency.**
A. 5 Hz to 10 Hz
B. 5 KHz to 10 KHz
C. 5 MHz to 10 MHz
D. 5 GHz to 10 GHz

Q.18 **RADAR operates on the principle of**
A. beats
B. Doppler's Effect
C. interference
D. Compton's Effect

Q.19 **Newton's formula for the speed of sound in fluids is**
A. $v = \sqrt{\dfrac{P}{\rho}}$
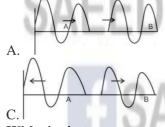B. $v = \sqrt{\dfrac{\rho}{E}}$
C. $v = \sqrt{\dfrac{E}{\eta}}$
D. $v = \sqrt{\dfrac{\gamma P}{\rho}}$

Q.20 **The speed of sound in vacuum at 10°C is**
A. $338.2\ ms^{-1}$
B. $332\ ms^{-1}$
C. $340\ ms^{-1}$
D. $0\ ms^{-1}$

Q.21 **Which one of the following graphs shows constructive interference?**

A.
B.

C.
D.

Q.22 **With rise in temperature, the speed of sound in a gas**
A. Increases
B. Decreases
C. Remains same
D. May increase or decrease depending upon air pressure

Q.23 **The value of γ for diatomic gas is**

A. 1.40 B. 1.29
C. 1.67 D. 1.47

Q.24 Which of the following has maximum value of $\gamma = \dfrac{C_p}{C_v}$

A. Monoatomic gas B. Polyatomic gas
C. Diatomic gas D. All have same value

Q.25 The displacement of particle in S.H.M. in one-time period, if its amplitude of its motion is "A" will be
A. Zero B. 2A
C. A D. 4A

Q.26 Which of the following is mechanical wave?
A. Light waves B. X-rays
C. Sound waves D. Radio waves

Q.27 Sound travels faster in moist air at STP because
A. Moist air is heavier than dry air
B. The pressure of moist air is greater than that of dry air
C. The value of γ of moist air is greater than that for dry air
D. The density of moist air is less than that of dry air

Q.28 The product of angular frequency (ω) and time period T will be
A. 1 B. 2π
C. $\dfrac{\pi}{2}$ D. π

Q.29 On decreasing the temperature, the frequency of an organ pipe becomes
A. Decrease B. Equal
C. Increase D. Infinity

Q.30 In a stationary wave the distance between consecutive antinodes is 25 cm. If the wave velocity is 300 ms^{-1}, then the frequency of wave will be
A. 150 Hz B. 600 Hz
C. 300 Hz D. 750 Hz

Q.31 A sitar wire vibrates with frequency of 330 vibrations per second. If its length is increased three times and tension is increased four times, then the frequency of the wire will be
A. 110 Hz B. 330 Hz
C. 220 Hz D. 440 Hz

Q.32 The length of a string is 1m, tension in it is 40N and mass of the string is 0.1 kg. Then the velocity of transverse waves produced in the string will be:
A. 400 ms^{-1} B. 80 ms^{-1}
C. 180 ms^{-1} D. 20 ms^{-1}

Q.33 A tube closed at one end and containing air produce fundamental note of frequency of 256 Hz. If the tube is open at both ends, the fundamental frequency will be:
A. 512 Hz B. 128 Hz
C. 384 Hz D. 64 Hz

Q.34 Which of the following laws of strings is not correct? Where "n" is frequency of string.

A. $n \propto \dfrac{1}{\sqrt{m}}$ B. $n \propto \sqrt{T}$

C. $n \propto \ell$ D. $n \propto \dfrac{1}{\ell}$

Q.35 When both source and listener move in the same direction with a velocity equal to half the velocity of sound, the change in frequency of the sound as detected by the listener is:
A. 50% B. Zero
C. 25% D. None of these

Q.36 The wavelength of the produced by a source is 0.8m. If the source moves towards the stationary listener at 32 ms^{-1}, what will be apparent wavelength of the sound? The velocity of sound is 320 ms^{-1}.
A. 0.80 m B. 0.40 m
C. 0.72 m D. 0.32 m

Q.37 The velocity of sound in air is 332 ms^{-1}. The length of a closed pipe whose frequency of second overtone is 332 Hz, will be:
A. 0.51 m   B. 1.25 m
C. 0.75 m   D. 1.75 m

Q.38 The velocity of sound in air is 330 ms^{-1}. The fundamental frequency of an organ pipe open at both ends and length 0.3 m will be.
A. 200 Hz   B. 300 Hz
C. 275 Hz   D. 550 Hz

Q.39 A source of sound of frequency 500 Hz is moving towards on observer with velocity 30 ms^{-1}. The speed of sound is 330 ms^{-1}. The frequency heard by observer will be:
A. 550 Hz   B. 530 Hz
C. 458.3 Hz   D. 454.5 Hz

Q.40 If a stretched-string is 4m and it has 4 loops of stationary waves, then wave length is
A. 1m   B. 2m
C. 3m   D. 4m

Q.41 If a string vibrates in "n" loops, the wavelength of stationary wave will be:
A. $\dfrac{2\ell}{n}$ B. $\dfrac{n\ell}{2}$
C. $\dfrac{2n}{\ell}$ D. $\dfrac{\ell}{2n}$

Q.42 In resonance tube, which of the followings is formed at open end
A. node   B. antinodes
C. neither a nor b   D. either a or b

Q.43 A tight wire is clamped at two points 2 m apart. It is plucked near one end, what are the three longest wavelengths produced on the vibrating wire:
A. 2 m, 1 m, 0.67 m   B. 4 m, 2 m, 1.33 m
C. 4 m, 2 m, 1 m   D. 1 m, 0.5 m, 0.33 m

Q.44 The frequency of the fundamental mode of transverse vibration of a stretched wire 1000 *mm* long is 250 Hz. When the wire is shortened to 500 *mm* at the same tension, what is the fundamental frequency?
A. 125 Hz   B. 250 Hz
C. 500 Hz   D. 1000 Hz

Q.45 If the speed of sound on a cold day is v_c and its speed on hot day is v_a then
A. $v_c = v_a$ B. $v_c < v_a$
C. $v_c > v_a$ D. v_c may be more or less than v_a

Q.46 A stretched string resonates with fundamental frequency of 50 Hz. The wavelength for its 3rd overtone is if speed of transverse wave in the string is 100 ms^{-1}
A. 66 cm   B. 33 cm
C. 50 cm   D. 100 cm

Q.47 Distance and displacement traveled by a vibrating body in a time equal to $\dfrac{3}{4}T$; where T is the period of the vibration
A. $3x_o, 3x_o$ B. $3x_o, 0$
C. $3x_o, x_o$ D. $2x_o, 0$

Q.48 The chasing car 'B' traveling at 20 ms^{-1} sounds a horn which the driver of leading car A travelling at 16 ms^{-1} estimates has frequency 340 Hz. The frequency which B's own drive hears (v = 340 ms^{-1})
A. 332 Hz   B. 336 Hz
C. 334 Hz   D. 338 Hz

Q.49 The ratio of 2nd overtone to 3rd overtone in stationary wave produced in an air column open at both ends is
A. $\dfrac{4}{3}$ B. $\dfrac{2}{3}$
C. $\dfrac{3}{4}$ D. $\dfrac{1}{2}$

Q.50 In one end close pipe system of length 50 cm then wavelength for 3rd mode of vibration when stationary wave is formed.

A. 66.6 cm   B. 40 cm

C. 20 cm   D. 33.3 cm

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CTS - T4

Physics

1 - D	11 - B	21 - A	31 - C	41 - A
2 - C	12 - D	22 - A	32 - D	42 - B
3 - C	13 - D	23 - A	33 - A	43 - B
4 - D	14 - wrong option	24 - A	34 - C	44 - C
5 - D	15 - C	25 - A	35 - B	45 - B
6 - D	16 - A	26 - C	36 - C	46 - C
7 - A	17 - C	27 - D	37 - B	47 - C
8 - C	18 - B	28 - B	38 - D	48 - B
9 - B	19 - A	29 - A	39 - A	49 - C
10 - C	20 - D	30 - B	40 - B	50 - B

Chemistry

1 - B	11 - D	21 - B	31 - C	41 - B
2 - D	12 - C	22 - A	32 - A	42 - A
3 - A	13 - B	23 - B	33 - A	43 - A
4 - D	14 - D	24 - A	34 - B	44 - C
5 - B	15 - C	25 - B	35 - A	45 - D
6 - A	16 - B	26 - C	36 - A	46 - A
7 - D	17 - B	27 - A	37 - D	47 - B
8 - C	18 - C	28 - B	38 - D	48 - D
9 - C	19 - D	29 - B	39 - A	49 - B
10 - C	20 - D	30 - D	40 - C	50 - B